

ceramic layers (12a-f; 22a-d; 41a-f) and at least partially holds the electrical connector (18a,b; 28a,b; 58a,b).

- 5 4. The drive or sensor element as claimed in claim 3,
in which the connector (18a,b; 28a,b; 58a,b) is a
wire which extends beyond the surfaces of the
piezoelectric ceramic layers (12a-f; 22a-d;
41a-f).
- 10 5. The drive or sensor element as claimed in one of
claims 3 or 4 having at least three piezoelectric
ceramic layers (12a-f; 22a-d; 41a-f) and at least
two grooves (14a-d; 24a-d; 56a-f), in which these
15 grooves (14a-d; 24a-d; 56a-f) are arranged offset
with respect to one another and with respect to a
longitudinal axis (29) of the drive or sensor
element.
- 20 6. The drive or sensor element as claimed in one of
claims 4 or 5 having a connector (18a,b; 28a,b;
58a,b) which is in the form of a wire and is a
wire having a rippled or zigzag structure.
- 25 7. The drive or sensor element as claimed in one of
claims 1 to 6 having piezoelectric ceramic layers
(12a-f; 22a-d; 41a-f) composed of PZT material.
- 30 8. The drive or sensor element as claimed in one of
claims 1 to 7 having piezoelectric ceramic layers
(12a-f; 22a-d; 41a-f) composed of
 $\text{PbMg}_{0.308}\text{Nb}_{0.617}\text{Ti}_{0.075}\text{O}_3$.
- 35 9. The drive or sensor element as claimed in one of
claims 1 to 8 having piezoelectric ceramic layers
(12a-f; 22a-d; 41a-f) composed of a material
having a Curie temperature of more than 400°C, for
example composed of $\text{Na}_{0.5}\text{Bi}_{4.5}\text{Ti}_4\text{O}_{15}$ or $\text{Bi}_3\text{TiNbO}_9$.

10. The drive or sensor element as claimed in one of
claims 1 to 9 having electrode layers (16a-e;
26a-d) composed of a metallic material having a
5 Curie temperature of more than 400°C.
11. The drive or sensor element as claimed in one of
claims 1 to 10 having electrode layers (16a-e;
26a-d) composed of bismuth-titanate.
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12. The drive or sensor element as claimed in one of
claims 4 to 11 having connectors (18a,b; 28a,b;
58a,b) which are in the form of wires and are
composed of a metallic material having high-
15 temperature stability at more than 250°C.
13. The drive or sensor element as claimed in one of
claims 4 to 11 having connectors (18a,b; 28a,b;
58a,b) which are in the form of wires and are
composed of a material which contains silver and
contains stainless steel, or of such a material
20 which contains a nickel alloy.
14. A method for producing an electromechanical drive
25 or sensor element having a layer structure, which
comprises the following steps:
- production of ceramic layers (12a-f; 22a-d;
41a-f) composed of electrically active material
using a method which is normal in ceramic
30 technology, having desired dimensions and
having a margin of 2-3 mm for each dimension
taking account of the following mechanical
machining;
 - grinding the ceramic layers (12a-f; 22a-d;
41a-f) until a predetermined thickness of, for
35 example, 0.15 to 03 mm [sic] is reached;

- cutting a groove (14a-d; 24a-d; 56a-f) in one face of the ceramic layers (12a-f; 22a-d; 14a-f) which is to be metallized;
 - in which case the depth of the groove (14a-d; 24a-d; 56a-f) must be no deeper than half the thickness of the ceramic layer (12a-f; 22a-d; 41a-f) under consideration;
 - coating at least one face of the ceramic layers (12a-f; 22a-d; 41a-f) with metal by applying a paste containing silver twice and subsequent heat treatment at a temperature of 800-820°C;
 - applying adhesive to the metallized surfaces of two ceramic layers (12a-f; 22a-d; 41a-f) using cellulose adhesive;
 - diffusion welding of the layers to which adhesive has been applied by heat treatment at a temperature of 780-800°C and single-axis compression at a pressure of 3-5 kg/cm² over a period of 3 hours and cooling to room temperature;
 - drawing in each case one connector wire (18a,b; 28a,b; 58a,b) into a groove (14a-d; 24a-d; 56a-f);
 - polarization of the drive or of the sensor element by the action of an electric field on the wires (18a,b; 28a,b; 58a,b) at high temperature;
 - connection of the same poles of the drive or of the sensor element;
 - checking of the desired parameters and piezo-electric characteristics of the drive or of the sensor element.
15. A level limit switch (70) having a drive and having a sensor element as claimed in one of claims 1 to 14.

16. The level limit switch (70) as claimed in claim 15, in which the sensor element is separated from the drive by a non-polarized ceramic layer (82d).

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17. An acceleration sensor (40) having a sensor element as claimed in one of claims 1 to 14.

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